

AMENDMENTS TO THE CLAIMS

Please amend claims 1, 19, 40, 61, 72, 73, 75-81 and 83-86, and cancel claims 2 and 3, without prejudice to pursuing these claims in unamended (or other) form in a continuation or other application. Following is a complete listing of claims, as amended:

1. (Currently Amended) A method for selecting a stimulation site in a language-disorder patient, comprising:

directing a patient to perform a language-based task, including directing the patient to repeat a noun;

directing information to be collected, the information corresponding to a level of neural activity in the patient's brain while the patient performs the language-based task; and

based at least in part on the information, selecting a stimulation site within the patient's skull, proximate the dura mater, and outside a cortical surface of the patient's brain for receiving an electrode coupleable to an electrical current.

2. (Cancelled)

3. (Cancelled)

4. (Original) The method of claim 1 wherein selecting a stimulation site includes selecting a stimulation site at least proximate to at least one of Broca's area, Wernicke's area, and neuronal connections extending between Broca's area and Wernicke's area.

5. (Original) The method of claim 1 wherein selecting a stimulation site includes selecting a stimulation site at least proximate to at least one of the middle temporal gyrus, the retrosplenial cortex and the retrosplenial cuneus of the brain.

6. (Original) The method of claim 1 wherein directing the patient to perform a language-based task includes directing the patient to perform a task that requires no verbal output.

7. (Original) The method of claim 1 wherein directing the patient to perform a language-based task includes directing the patient to silently generate a verb associated with a common noun.

8. (Cancelled)

9. (Original) The method of claim 1 wherein directing the patient to perform a language-based task includes directing the patient to retrieve a word based on a letter cue.

10. (Original) The method of claim 1 wherein directing the patient to perform a language-based task includes directing the patient to retrieve a word based on a visual cue.

11. (Original) The method of claim 1 wherein directing the patient to perform a language-based task includes directing the patient to respond nonverbally to an oral task that requires the patient to understand the difference between two auditory commands.

12. (Original) The method of claim 1, further comprising implanting an electrode at least proximate to the stimulation site.

13. (Original) The method of claim 1, further comprising:
administering a neuroexcitatory drug to the patient; and
directing the information to be collected while the patient performs the language-based task with the neuroexcitatory drug active in the patient's body.

14. (Original) The method of claim 1 wherein directing information to be collected includes directing a computer-based routine to collect the information.

15. (Original) The method of claim 1, further comprising directing the formation of an image of at least a portion of the patient's brain, with at least a portion of the image having features representative of the information.

16. (Original) The method of claim 1 wherein directing information to be collected includes directing the formation an image of at least a portion of the patient's brain, the image including a first region with a characteristic of the first region having a first value, the image further including a second region with a characteristic of the second region having a second value different than the first value.

17. (Original) The method of claim 1 wherein directing a patient to perform a language-based task includes directing the patient to perform a first language-based task and wherein directing information to be collected includes directing first information to be collected while the patient performs the first language-based task, and wherein the method further comprises:

directing the patient to perform a second language-based task;

directing second information to be collected while the patient performs the second language-based task; and

determining a location for the stimulation site based on both the first information and the second information.

18. (Original) The method of claim 1 wherein directing a patient to perform a language-based task includes directing the patient to perform a first language-based task subject to a language disorder and wherein directing information to be collected includes directing first information to be collected while the patient performs the first language-based task, and wherein the method further comprises:

- monitoring a first image of the patient's brain function while the patient performs the first language-based task;
- identifying a second language-based task subject to a language disorder;
- monitoring a second image of the patient's brain function while the patient performs the second language-based task; and
- comparing the first and second images to identify at least one stimulation site of the brain.

19. (Currently Amended) A method for treating a language disorder of a patient, comprising:

- selecting a stimulation site of a patient's brain, the stimulation site being located within the patient's skull, proximate the dura mater, and outside a cortical surface of the patient's brain;
- positioning at least one electrode at the stimulation site;
- coupling the at least one electrode to a source of electrical potential; and
- at least reducing a language disorder of the patient by applying electrical stimulation directly to the stimulation site via the at least one electrode while not actively engaging the patient in a language-based task.

20. (Original) The method of claim 19 wherein positioning at least one electrode includes implanting the at least one electrode.

21. (Original) The method of claim 19, further comprising:
directing the patient to perform a language-based task;

directing information to be collected, the information corresponding to a level of neural activity in the patient's brain while the patient performs the language-based task; and
selecting the stimulation site based at least in part on the information.

22. (Original) The method of claim 19 wherein applying an electrical stimulation includes applying an electrical stimulation to the left hemisphere of the brain.

23. (Original) The method of claim 19 wherein applying an electrical stimulation includes applying an electrical stimulation to the right hemisphere of the brain.

24. (Cancelled)

25. (Original) The method of claim 19 wherein at least reducing a language disorder of the patient includes at least reducing an aphasia of the patient.

26. (Original) The method of claim 19 wherein applying an electrical stimulation includes applying an electrical stimulation at least proximate to at least one of Broca's area, Wernicke's area, and neuronal connections extending between Broca's area and Wernicke's area.

27. (Original) The method of claim 19 wherein applying an electrical stimulation includes applying an electrical stimulation to at least one of the middle temporal gyrus, the retrosplenial cortex and the retrosplenial cuneus of the brain.

28-31. (Cancelled)

32. (Original) The method of claim 19, further comprising:
administering a neuroexcitatory drug to the patient; and

applying the electrical stimulation while the neuroexcitatory drug is active in the patient's body.

33. (Original) The method of claim 19 wherein applying electrical stimulation includes applying electrical stimulation below a level that causes movement, speech or sensation in the patient.

34. (Original) The method of claim 19 wherein applying electrical stimulation includes applying electrical stimulation at or above a level that causes movement, speech or sensation in the patient.

35. (Original) The method of claim 19 wherein at least reducing a language disorder includes eliminating the language disorder.

36. (Original) The method of claim 19, further comprising locating the stimulation site relative to an anatomical feature of the patient.

37. (Original) The method of claim 19, further comprising locating the stimulation site relative to a fiducial having a fixed location relative to the patient's skull.

38. (Original) The method of claim 19 wherein applying an electrical stimulation includes applying a varying electrical stimulation signal having a frequency of from about 5 Hz to about 200 Hz.

39. (Original) The method of claim 19 wherein applying an electrical stimulation includes applying a varying electrical stimulation signal having an electrical potential of from about 0.25 volts to about 5.0 volts.

40. (Currently Amended) A method for treating a language disorder, comprising:
directing a patient to perform a language-based task, including directing the patient
to retrieve a word based on a letter cue;
directing information to be collected, the information corresponding to a level of
neural activity in the patient's brain while the patient performs the language-
based task; and
at least reducing a language disorder of the patient by applying an electrical
stimulation at least proximate to a stimulation site, the location of the
stimulation site being based at least in part on the information, and being
proximate the dura mater and outside a cortical surface of the patient's brain.
41. (Original) The method of claim 40 wherein directing the patient to perform a
language-based task includes directing the patient to perform a task that requires no
verbal output.
42. (Original) The method of claim 40 wherein directing the patient to perform a
language-based task includes directing the patient to silently generate a verb associated
with a common noun.
43. (Original) The method of claim 40 wherein directing the patient to perform a
language-based task includes directing the patient to repeat a noun.
44. (Cancelled)
45. (Original) The method of claim 40 wherein directing the patient to perform a
language-based task includes directing the patient to retrieve a word based on a visual
cue.

46. (Original) The method of claim 40 wherein directing the patient to perform a language-based task includes directing the patient to respond nonverbally to an oral task that requires the patient to understand the difference between two auditory commands.

47. (Original) The method of claim 40, further comprising:
administering a neuroexcitatory drug to the patient; and
applying the electrical stimulation while the neuroexcitatory drug is active in the patient's body.

48. (Original) The method of claim 40, further comprising:
administering a neuroexcitatory drug to the patient; and
directing the information to be collected while the patient performs the language-based task with the neuroexcitatory drug active in the patient's body.

49. (Original) The method of claim 40 wherein directing information to be collected includes directing a computer-based routine to collect the information.

50. (Original) The method of claim 40, further comprising directing the formation of an image of at least a portion of the patient's brain, with at least a portion of the image having features representative of the information.

51. (Original) The method of claim 40 wherein directing information to be collected includes directing the formation an image of at least a portion of the patient's brain, the image including a first region with a characteristic of the first region having a first value, the image further including a second region with a characteristic of the second region having a second value different than the first value.

52. (Original) The method of claim 40 wherein directing information to be collected includes directing information to be collected corresponding to blood oxygen levels in the brain.

53. (Original) The method of claim 40, further comprising implanting at least one electrode at least proximate to the stimulation site, and wherein applying an electrical stimulation includes applying an electrical signal to the at least one electrode.

54. (Original) The method of claim 40, further comprising placing an electrode at least proximate to the stimulation site.

55. (Original) The method of claim 40 wherein directing a patient to perform a language-based task includes directing the patient to perform a first language-based task and wherein directing information to be collected includes directing first information to be collected while the patient performs the first language-based task, and wherein the method further comprises:

directing the patient to perform a second language-based task;

directing second information to be collected while the patient performs the second language-based task; and

determining a location for the stimulation site based on both the first information and the second information.

56-60. (Cancelled)

61. (Currently Amended) A method for treating a brain disorder, comprising:

directing a patient to perform a task, including directing the patient to respond nonverbally to an oral task that requires the patient to understand the difference between two auditory commands;

directing information to be collected, the information corresponding to a level of neural activity in the patient's brain while the patient performs the task; and

applying an electrical stimulation at least proximate to a stimulation site of the patient's brain while directing the information to be collected, the stimulation site being proximate the dura mater and outside a cortical surface of the patient's brain.

62. (Original) The method of claim 61 wherein applying an electrical stimulation includes at least reducing a severity of a brain disorder of the patient.

63. (Original) The method of claim 61 wherein directing information to be collected includes directing the collection of functional magnetic resonance image data.

64. (Original) The method of claim 61 wherein directing a patient to perform a task includes directing the patient to perform a language-based task.

65. (Original) The method of example 61, further comprising implanting an electrode at least proximate to the stimulation site, wherein applying an electrical stimulation includes applying an electrical stimulation via the electrode.

66. (Original) The method of claim 61 wherein directing the patient to perform a task includes directing the patient to perform a language-based task that requires no verbal output.

67. (Original) The method of claim 61 wherein directing the patient to perform a task includes directing the patient to silently generate a verb associated with a common noun.

68. (Original) The method of claim 61 wherein directing the patient to perform a task includes directing the patient to repeat a noun.

69. (Original) The method of claim 61 wherein directing the patient to perform a task includes directing the patient to retrieve a word based on a letter cue.

70. (Original) The method of claim 61 wherein directing the patient to perform a task includes directing the patient to retrieve a word based on a visual cue.

71. (Cancelled)

72. (Currently Amended) A method for selecting a stimulation site in a language-disorder patient, comprising:

directing a patient to perform a language-based task, including directing the patient to retrieve a word based on a letter cue;

directing information to be collected, the information corresponding to a level of neural activity in the patient's brain while the patient performs the language-based task; and

based at least in part on the information, selecting a stimulation site within the patient's skull, proximate the dura mater, and outside a cortical surface of the patient's brain for receiving an electrode coupleable to an electrical current.

73. (Currently Amended) A method for selecting a stimulation site in a language-disorder patient, comprising:

directing a patient to perform a language-based task, including directing the patient to respond nonverbally to an oral task that requires the patient to understand the difference between two auditory commands;

directing information to be collected, the information corresponding to a level of neural activity in the patient's brain while the patient performs the language-based task; and

based at least in part on the information, selecting a stimulation site within the patient's skull, proximate the dura mater, and outside a cortical surface of the patient's brain for receiving an electrode coupleable to an electrical current.

74. (Previously Presented) A method for selecting a stimulation site in a language-disorder patient, comprising:

administering a neuroexcitatory drug to a patient;

directing the patient to perform a language-based task;

directing information to be collected, the information corresponding to a level of neural activity in the patient's brain while the patient performs the language-based task with the neuroexcitatory drug active in the patient's body; and based at least in part on the information, selecting a stimulation site within the patient's skull for receiving an electrode coupleable to an electrical current.

75. (Currently Amended) A method for selecting a stimulation site in a language-disorder patient, comprising:

directing a patient to perform a first language-based task;
directing first information to be collected, the first information corresponding to a level of neural activity in the patient's brain while the patient performs the first language-based task;
directing the patient to perform a second language-based task;
directing second information to be collected while the patient performs the second language-based task; and
based at least in part on both the first information and the second information, selecting a stimulation site within the patient's skull, proximate the dura mater, and outside a cortical surface of the patient's brain for receiving an electrode coupleable to an electrical current.

76. (Currently Amended) A method for selecting a stimulation site in a language-disorder patient, comprising:

directing a patient to perform a first language-based task;
directing first information to be collected, the first information corresponding to a level of neural activity in the patient's brain while the patient performs the first language-based task;
monitoring a first image of the patient's brain function while the patient performs the first language-based task;
identifying a second language-based task subject to a language disorder;

monitoring a second image of the patient's brain function while the patient performs the second language-based task; and
comparing the first and second images to identify at least one stimulation site of the brain and within the patient's skull, proximate the dura mater, and outside a cortical surface of the patient's brain for receiving an electrode coupleable to an electrical current.

77. (Currently Amended) A method for treating a language disorder of a patient, comprising:

selecting a stimulation site of a patient's brain, the stimulation site being located within the patient's skull, proximate the dura mater, and outside a cortical surface of the patient's brain;
positioning at least one electrode at the stimulation site;
coupling the at least one electrode to a source of electrical potential;
at least reducing a language disorder of the patient by applying electrical stimulation directly to the stimulation site via the at least one electrode; and
engaging the patient in a speech therapy task while applying the electrical stimulation.

78. (Currently Amended) A method for treating a language disorder of a patient, comprising:

selecting a stimulation site of a patient's brain, the stimulation site being located within the patient's skull, proximate the dura mater, and outside a cortical surface of the patient's brain;
positioning at least one electrode at the stimulation site;
coupling the at least one electrode to a source of electrical potential;
at least reducing a language disorder of the patient by applying electrical stimulation directly to the stimulation site via the at least one electrode; and
not engaging the patient in a speech therapy task while applying the electrical stimulation.

79. (Currently Amended) A method for treating a language disorder of a patient, comprising:

selecting a stimulation site of a patient's brain, the stimulation site being located within the patient's skull, proximate the dura mater, and outside a cortical surface of the patient's brain;

positioning at least one electrode at the stimulation site;

coupling the at least one electrode to a source of electrical potential; and

eliminating the language disorder of the patient by applying electrical stimulation directly to the stimulation site via the at least one electrode.

80. (Currently Amended) A method for treating a language disorder, comprising: directing a patient to perform a language-based task, including directing the patient to repeat a noun;

directing information to be collected, the information corresponding to a level of neural activity in the patient's brain while the patient performs the language-based task; and

at least reducing a language disorder of the patient by applying an electrical stimulation at least proximate to a stimulation site, the location of the stimulation site being based at least in part on the information, and being proximate the dura mater and outside a cortical surface of the patient's brain.

81. (Currently Amended) A method for treating a language disorder, comprising: directing a patient to perform a language-based task, including directing the patient to respond nonverbally to an oral task that requires the patient to understand the difference between two auditory commands;

directing information to be collected, the information corresponding to a level of neural activity in the patient's brain while the patient performs the language-based task; and

at least reducing a language disorder of the patient by applying an electrical stimulation at least proximate to a stimulation site, the location of the

stimulation site being based at least in part on the information, and being proximate the dura mater and outside a cortical surface of the patient's brain.

82. (Previously Presented) A method for treating a language disorder, comprising:

- administering a neuroexcitatory drug to the patient;
- directing a patient to perform a language-based task;
- directing information to be collected while the patient performs the language-based task with the neuroexcitatory drug active in the patient's body, the information corresponding to a level of neural activity in the patient's brain while the patient performs the language-based task; and
- at least reducing a language disorder of the patient by applying an electrical stimulation at least proximate to a stimulation site, the location of the stimulation site being based at least in part on the information.

83. (Currently Amended) A method for treating a language disorder, comprising:
- directing a patient to perform a first language-based task;
 - directing first information to be collected, the first information corresponding to a level of neural activity in the patient's brain while the patient performs the first language-based task;
 - directing the patient to perform a second language-based task;
 - directing second information to be collected while the patient performs the second language-based task; and
 - at least reducing a language disorder of the patient by applying an electrical stimulation at least proximate to a stimulation site, the location of the stimulation site being based at least in part on both the first information and the second information, and being proximate the dura mater and outside a cortical surface of the patient's brain.

84. (Currently Amended) A method for treating a brain disorder, comprising:
directing a patient to perform a task, including directing the patient to repeat a noun;
directing information to be collected, the information corresponding to a level of
neural activity in the patient's brain while the patient performs the task; and
applying an electrical stimulation at least proximate to a stimulation site of the
patient's brain while directing the information to be collected, the stimulation
site being proximate the dura mater and outside a cortical surface of the
patient's brain.

85. (Currently Amended) A method for treating a brain disorder, comprising:
directing a patient to perform a task, including directing the patient to retrieve a word
based on a letter cue;
directing information to be collected, the information corresponding to a level of
neural activity in the patient's brain while the patient performs the task; and
applying an electrical stimulation at least proximate to a stimulation site of the
patient's brain while directing the information to be collected, the stimulation
site being proximate the dura mater and outside a cortical surface of the
patient's brain.

86. (Currently Amended) A method for treating a language disorder of a patient,
comprising:
selecting a stimulation site of a patient's brain, the stimulation site being located
within the patient's skull, proximate the dura mater, and outside a cortical
surface of the patient's brain;
locating the stimulation site relative to a fiducial having a fixed location relative to
the patient's skull;
positioning at least one electrode at the stimulation site;
coupling the at least one electrode to a source of electrical potential; and
at least reducing a language disorder of the patient by applying electrical stimulation
directly to the stimulation site via the at least one electrode.